DENON

Hi-Fi Stereo Tuner

SERVICE MANUAL MODEL TU-450/450L

TU450 2-BAND (AM-FM) STEREO TUNER TU450L 3-BAND (LW-MW-FM) STEREO TUNER



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NIPPON COLUMBIA CO., LTD.

SPECIFICATIONS

FM SECTION
Frequency Range:

Frequency Range: 87.50 ~ 108.00 MHz

Antenna: 75 ohm unbalanced/300 ohm

balanced

Usable Sensitivity: 1.0 μV (11.2 dBf)

Solution Stereo: 23 μ V (38.5 dBf)

Monaural: $3.1 \mu V$ (21.2 dBf) Image Rejection: 70 dB

IF Rejection: 85 dB Spurious Response Rejection: 80 dB AM Suppression: 50 dB

Effective Selectivity: 75 dB (±400 kHz)

Capture Ratio: 1.5 dB

Frequency Response: 20 Hz to 15 kHz +0.2 dB Signal-to-noise Ratio: Monaural: 80 dB

Stereo: 76 dB

Total Harmonic Distortion:

Monaural 1 kHz 0.3% (at 100% modulation)
Stereo 1 kHz 0.7% (at 90% modulation)

Stereo Separation: 1 kHz 40 dB Muting Level: 10 μ V

Output Level (at 100%

modulation): 0.6 V (75 kHz deviation)

AM SECTION
MEDIUM WAVE

Frequency Range: 522 ~ 1611 kHz

Antenna Terminal: Terminal Type, with Loop Antenna

Usable Sensitivity: $18 \mu V$

Selectivity: 33 dB (9 kHz) Image Rejection: 35 dB

Signal-to-noise Ratio: 53 dB Total Harmonic Distortion: 0.6%

Output Level (at 30%

modulation): $0.18 \lor$ LONG WAVE (For TU-450L only)

Frequency Range: 153 ~ 360 kHz

Usable Sensitivity: $30 \mu V$

Selectivity: 35 dB (±9 kHz)

Image Rejection:50 dBSignal-to-noise Ratio:50 dB

OTHERS

Power Supply: AC 220 V/50 Hz (for Europe)

AC 240 V/50 Hz (for England for EK

Version only)

Power Consumption: AC 7 W

Dimensions: 434 mm (17-3/32") W x 70 mm

(2-3/4") H x 238 mm (9-3/8") D

Net Weight: 3.0 kg (6 lbs. 10 oz)

Design and specifications are subject to change without prior notice.

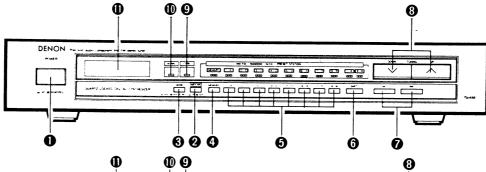
NOTE: The following codes correspond to the appropriate models.

E2 for Europe, EK for U.K.

This Service Manual is prepared based on E2 BLACK Version.

FUNCTIONS OF PANEL CONTROLS

• TU-450



● TU-450L

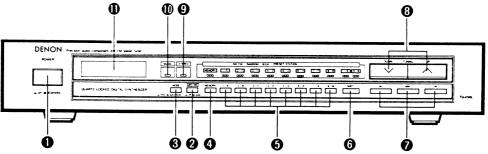


Fig. 1

- 1 POWER (Power On/Standby Switch)
- MPX NR (MPX Noise Reduction Switch)
 - 👤 auto, 💻 off
- MODE (Mode Switch)
 - auto/mute, mono
- ← MEMORY (Memory Button) *
- (5) PRESET CHANNEL 1 to 8 (Preset Channel Buttons)
- SHIFT (Change Memory)

1-8 ↔ 9-16

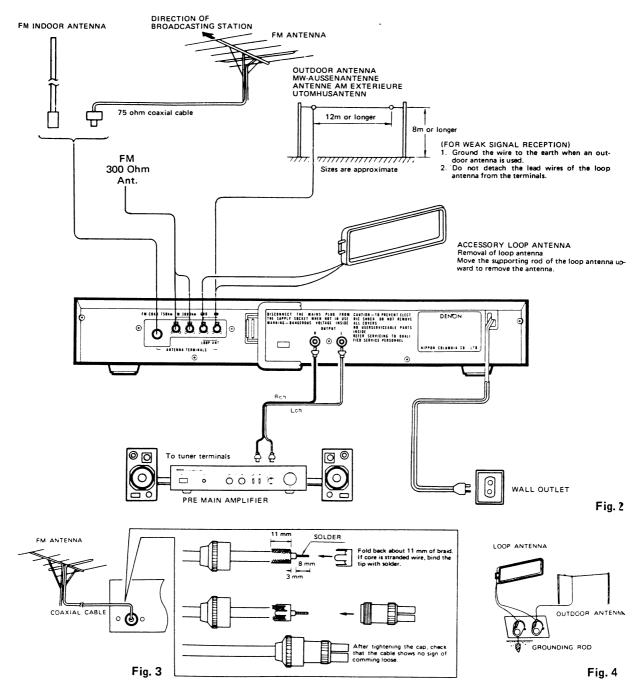
- (7) SELECT (Selector Buttons)
 - FM, AM: TU-450, FM, MW, LW: TU-450L
- 8 TUNING (Tuning Buttons)

∨ down, ∧ up

- 9 STEREO (Stereo Indicator)
- 10 SIGNAL (Signal-Strength Indicators)
- (1) DIGITAL FREQUENCY INDICATOR

-2-

CONNECTIONS



ANTENNA INSTALLATION

LEAD WIRE FM INDOOR ANTENNA

A lead wire indoor antenna can be used in a wood-frame house where broadcasting stations are located nearby and trong signals can be received. While receiving an FM program, extend the antenna. Orient for optimal reception and mount the antenna on the wall or ceiling.

- * In general, FM indoor antenna might not consistently assure stable reception, due to environmental changes. In such case use an FM indoor antenna temporarily until an outdoor antenna is installed.
- FM OUTDOOR ANTENNA CONNECTION (Fig. 3)

Use 75-ohm coaxial cable or 300 ohm ribbon feeder, to connect the outdoor antenna and the tuner. The 75-ohm o axial cable (3C-2V, 5C-2V) is preferable to obtain better performance of the tuner.

* Contact your local dealer for details on selection and installation of the FM outdoor antenna.

When connecting the coaxial cable to the antenna terminal using the DIN connector, please refer to the procedures in Fig. 3.

• MW and LW ANTENNA CONNECTION (Fig. 4)

Since this model is provided with a high-performance loop antenna at the back panel, this accessory antenna can effectively be used for optimal reception in places where broadcasting stations are located nearby and relatively strong signals are received with low noise.

Orient the loop antenna horizontally for obtaining optimal reception.

In places where strong, clear signals are not received due to the particular location and/or environmental conditions, connect a vinyl lead wire to the MW/LW antenna terminals and hold it to the wall or lintel.

In places where broadcasting stations are too far away and only weak signals are received, or where signals are blocked by obstacles, install an outdoor antenna for MW/LW.

* Even if an outdoor antenna is installed, do not detach the loop antenna.

GROUNDING

If there is much noise during reception of a radio program, it is recommended that a grounding wire be used to ground the unit.

Connect a thick vinyl lead wire to the "GND" terminal, and wind the unconnected bare end around a metal water pipe, a grounding rod, or a grounded copper plate.

* Do not connect a grounding wire to a gas pipe in order to prevent explosion of fire.

BLOCK DIAGRAM

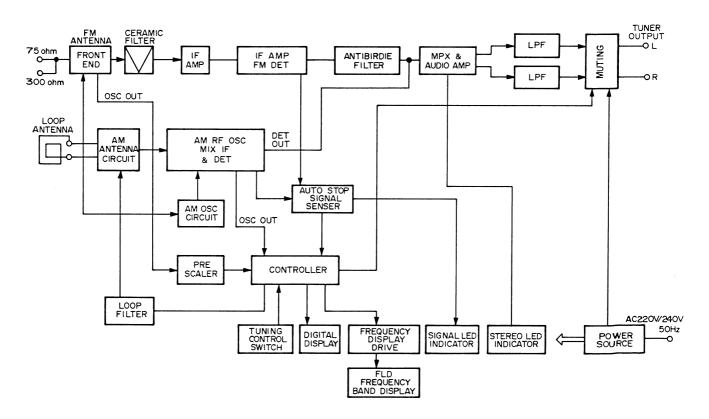


Fig. 5

REMOVE OF EACH SECTION

- 1. How to remove the top cover (Fig. 6)
 - (1) Remove the four screws on both sides.
 - (2) Raise the back of the top cover and remove it.

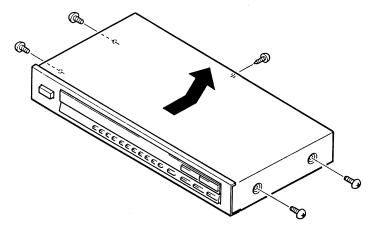
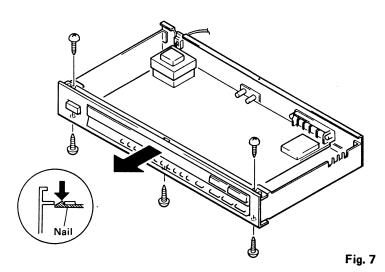


Fig. 6

2. How to remove the Front Panel Ass'y (Fig. 7)

- (1) Remove the five screws.
- (2) Remove the nail in the center of the Front Panel.
- (3) Pull out the F/Panel forwardly.



3. How to remove the Inner Panel (Fig. 8)

- (1) Detach the four connectors.
- (2) Remove the two screws.

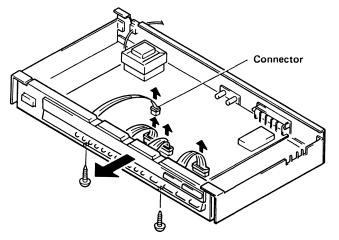
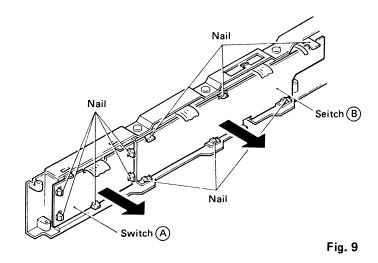


Fig. 8

4. How to remove the Switch Unit P.W.B. (Fig. 9)

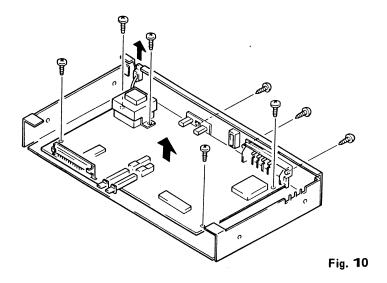
- A. Switch (A) Unit P.W.B.
 - (1) Remove the four nails.
- B. Switch B Unit P.W.B.
 - (1) Remove the six nails.



5. How to remove the Main Unit P.W.B. (Fig. 10) Tuner Unit P.W.B.

(1) Remove the three screws of the Unit and the two screws for connecting the transformer.

- (2) Detach the cord bush of the AC cord.
- (3) Remove the three screws of the Back Panel.



METHOD OF ADJUSTMENTS

When making adjustments, be sure the power supply is at the rated voltage and the room air is on normal conditions with respect to temperature and humidity.

INSTRUMENT HOOK-UP DIAGRAM

FM

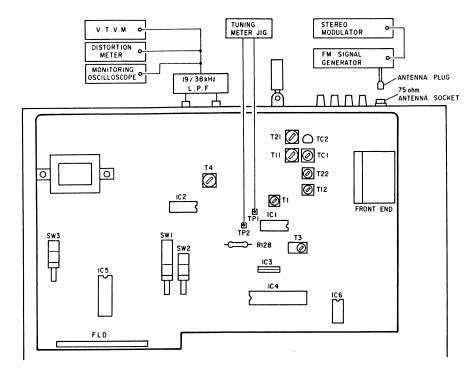


Fig. 11

AM

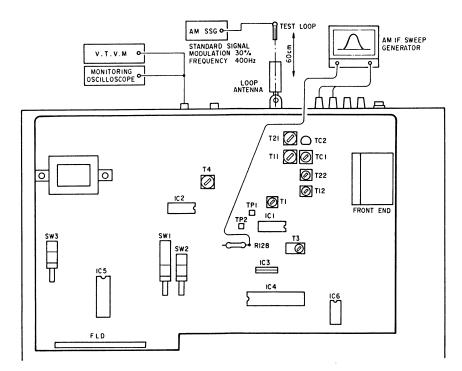


Fig. 12

Tuning Meter Jig

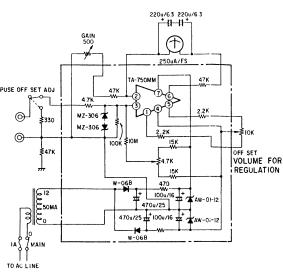


Fig. 13

FM/MPX ALIGNMENT (Fig. 11)

INSTRUMENT CONNECTIONS AND SETTING

Preparation

1. Connection of Measuring Equipment

(1) The modulated output of the stereo modulator is supplied to an FM signal generator. Connect the output end of the FM signal generator to the antenna terminal (75 ohm) of the unit. Set the stereo modulator to the following condi-

L + R:

67.5 kHz deviation

1 kHz (internal modulation frequency)

Pilot: 7.5 kHz deviation

- (2) Connect a filter jig of 19 kHz to the output terminal L of the unit. Then, connect the output of the filter jig to a distortion meter, the output of which is in turn connected to an oscilloscope for monitoring.
- (3) Connect tuning jigs to TP. 1 and 2.

LW or MW

(1) The AM signal generator should be set as follows:

Modulation: 30%, modulation frequency: 400 Hz (Antenna input signal level: about 60 dB/m).

	Alignment	Tuning			Input			Ou	tput	Adju	ustment	
Step	Item	Frequency Setting	Type	Frequency	Input Level	Modulation	Coupling	Type	Connect to	Points	Adjust to	
1	Tuning Center	98 MHz	FM SSG, Mono	98 MHz	60 dBμ	None	Antenna Terminal	Center Meter	T.P. 1, 2	T-1	Center of Tuning Meter	Function: FM Mode: Auto
2	Distortion (Stereo)	98 MHz	FM SSG Stereo (L)	98 MHz	60 dBμ	Main: 1 kHz L-ch 67.5 kHz Dev. Pilot: 7.5 kHz Dev.	Antenna Terminal	Distortion Meter	Output Terminal (L)	IFT on Front End	Minimum Distortion	Function: FM Mode: Auto

LW AND MW ALIGNMENT (Fig. 12)

1	IF	_	IF Sweep	_	Input Level is not over to work A.G.C.	-	Antenna Terminal	Oscilloscope	R128	T-3	Maximum Height and Best Symmetry Curve	Function: MW Center of Wave Form: 450 kHz
2	Tracking	603 kHz	AM SSG	603 kHz	Input Level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M.	Output Terminal (L)	T-11	Maximum Output	Function: MW
	Alignment MW	1404 kHz	AM SSG	1404 kHz	Input Level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M.	Output Terminal (L)	TC-1	Maximum Output	Function: MW
	Tracking	163 kHz	AM SSG	163 kHz	Input Level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M.	Output Terminal (L)	T-21	Maximum . Output	Function: LW
3	Alignment LW	330 kHz	AM SSG	330 kHz	Input Level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M.	Output Terminal (L)	TC-2	Maximum Output	Function: LW

TUNING UNIT Alignment Points (Component Side) ETC0852B TUNER UNIT (for 3 Band)

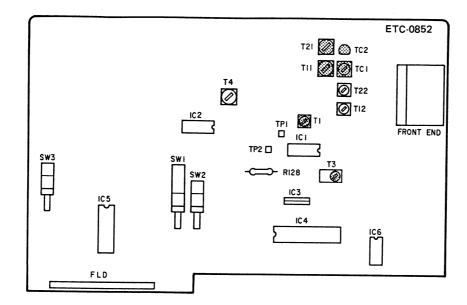


Fig. 14

ETC0861D TUNER UNIT (for 2 Band)

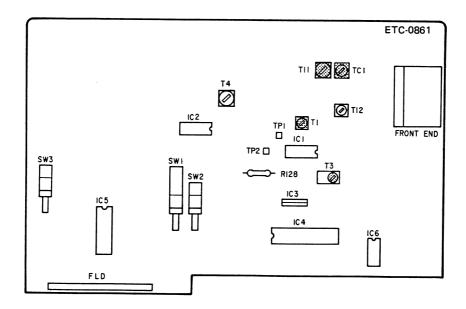
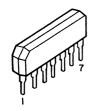


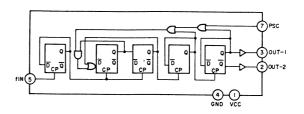
Fig. 15

SEMICONDUCTORS

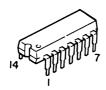
• IC's

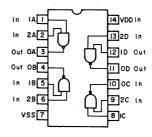
TD6104P (Toshiba)



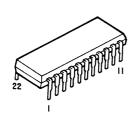


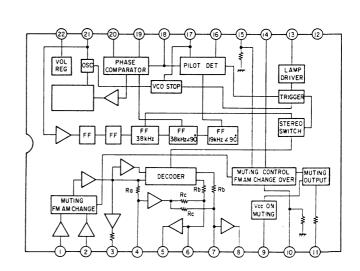
HD14011BP (Hitachi)



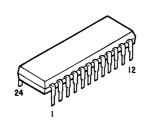


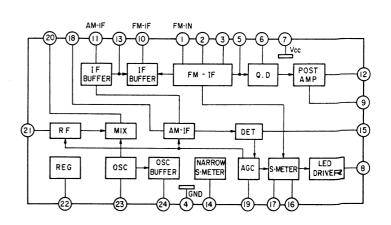
LA3401 (Sanyo)





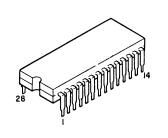
LA1266 (Sanyo)

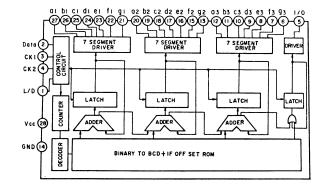




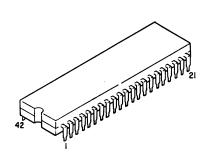
TU450/450L

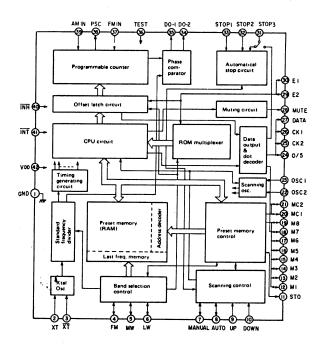
TD6301AP (Toshiba)





TD9147P (Toshiba)



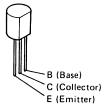


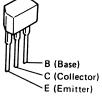
• TRANSISTORS (including FET)

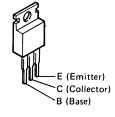
2SC461(C) 2SC1815(BL) 2SA1048(Y/GR) 2SC2458(Y/GR)

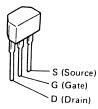
2SD880(Y)

(FET) 2SK365(BL/GR)









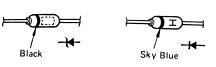
• DIODES, LEDS

HZ7A-1 HZ12C-2 1S2076

SVC321SP-D2

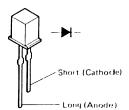
PB103M

3M (LED) LT9233 (Green) LT9213R (Red)

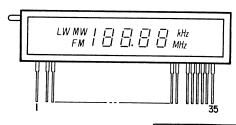








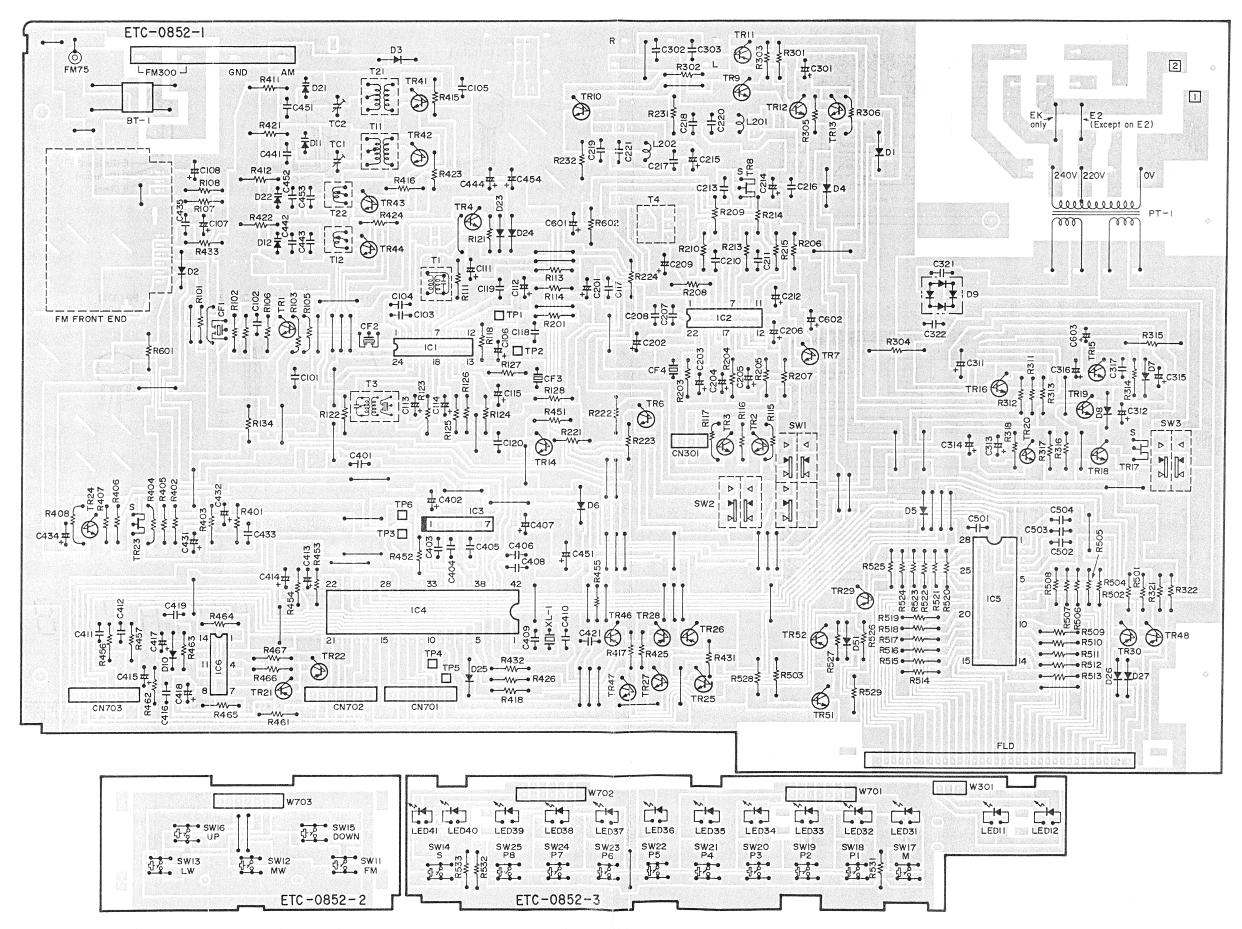
7BT168A (Futaba)



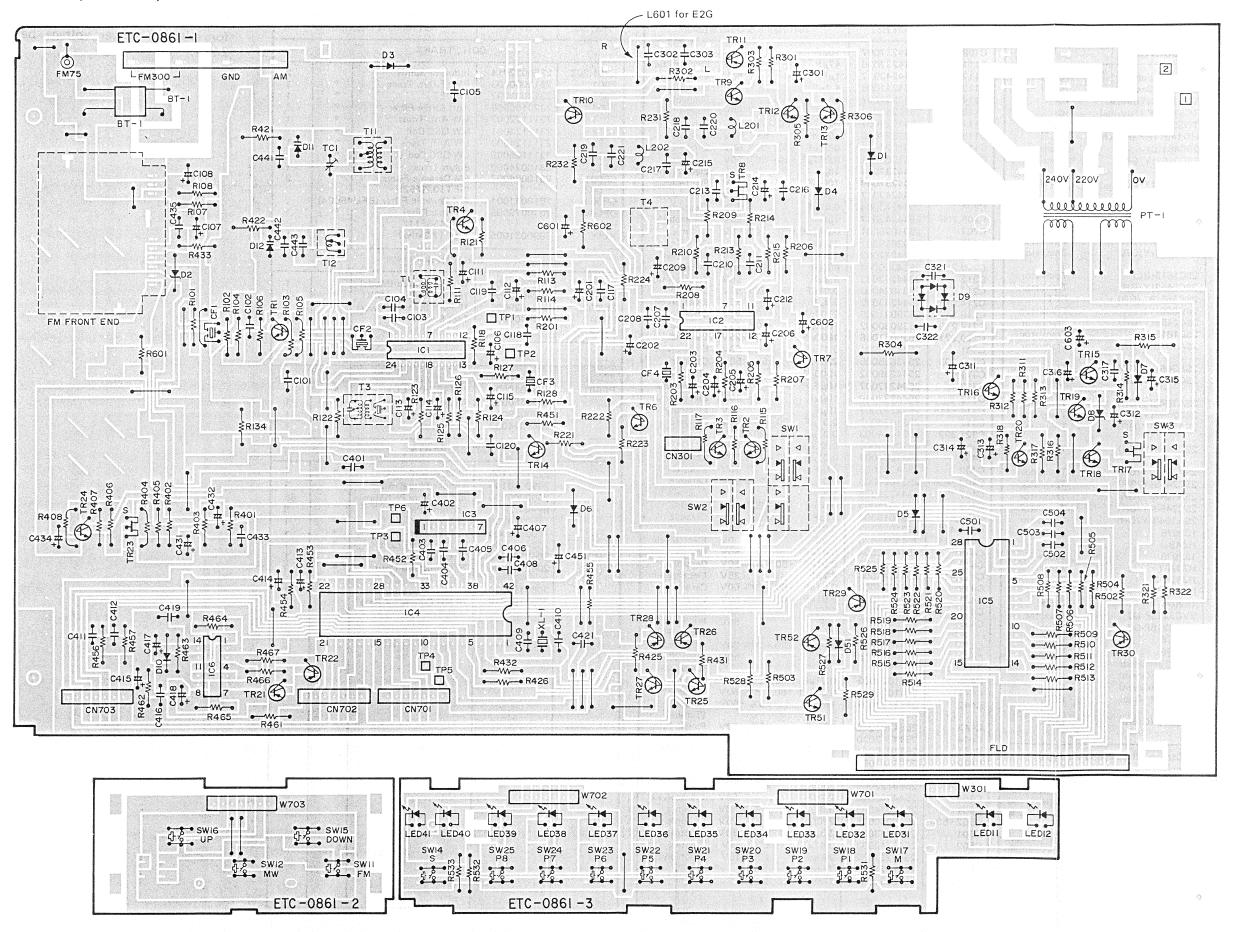


PIN NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
ELECTRODE	F	NP	LW	MW	KHZ	G	FM MHz D.P	65 65	94	14	•4	d4	c 4	64	04	93	13	G	•3	d3	с3	b 3	٥3	92	12	•2	d2	c 2	NP	95	92	9	bi • i	g I	F

ETC0852B TUNER UNIT (for 3 Band)



ETC0861D TUNER UNIT (for 2 Band)



ETC0852B TUNER UNIT PARTS LIST (for 3 Band)

	- I OIVEIL O	INIT PARTS LIST	(
Ref. No.	Part No.	Part Name & Desc	riptions
	SEM	IICONDUCTORS	
IC001	2630438008	LA1266 (Sanyo)	ıc •
IC002	2630439007	LA3401 (Sanyo)	IC •
IC003	2630232000	TD6104P (Toshiba)	ıc l
IC004	2620452104	TC9147BP (Toshiba)	ic
IC005	2620453006	TD6301AP (Toshiba)	ic
	1	1	ic
IC006	2620300007	HD14011BP (Hitachi)	•
TR001	2730025023	2SC461(C)	Transistor
TR002 ∼004	2730322001	2SC2458(Y/GR)	Transistor
TR006, 007	2730322001	2SC2458(Y/GR)	Transistor
TR008	2750053004	2SK365(BL/GR)	FET
TR009, 010	2730322001	2SC2458(Y/GR)	Transistor
TR011	2710194000	2SA1048(Y/GR)	Transistor
TR012	2730322001	2SC2458(Y/GR)	Transistor
~014			-
TR015	2730198015	2SC1815(BL)	Transistor
TR016	2730322001	2SC2458(Y/GR)	Transistor
TR017	2750053004	2SK365(BL/GR)	FET
TR018	2740065002	2SD880(Y)	Transistor
TR019	2730322001	2SC2458(Y/GR)	Transistor
TR020	2730322001	2SC1815(BL)	Transistor
TR021, 022	2710194000	2SA1048(Y/GR)	Transistor
TR023	2750053004	2SK365(BL/GR)	FET
TR024, 025	2730322001	2SC2458(Y/GR)	Transistor
	0740404000	0044040()((00)	-
TR026	2710194000	2SA1048(Y/GR)	Transistor
TR027	2730322001,	2SC2458(Y/GR)	Transistor
TR028 ~030	2710194000	2SA1048(Y/GR)	Transistor
TR041	2730322001	2SC2458(Y/GR)	Transistor
~044	0710101000	2004040(V/CD)	Tunnation
TR046	2710194000	2SA1048(Y/GR)	Transistor
TR047	2730322001	2SC2458(Y/GR)	Transistor
TR048	2710194000	2SA1048(Y/GR)	Transistor
TR051	2730322001	2SC2458(Y/GR)	Transistor
TR052	2710194000	2SA1048(Y/GR)	Transistor
D001	2760049008	1S2076	Diode
1			
D002	2760185014	HZ4B-3	Zener
D003~006	2760049008	1S2076	Diode
D007	2760051054	HZ7A-1	Zener
D008	2760255038	HZ12C-2	Zener
D009	2760446009	PB103M	
			Diode
D010	2760049008	1S2076	
D011,012	2760302004	SVC321SP-D2	Varactor
D021,022	2760302004	SVC321SP-D2	Varactor
D023~027	2760049008	1S2076	Diode
D051	2760049008	1S2076	Diode
LE011	3939173005	LT9213R (Red)	LED
	3939356000	LT9233 (Green)	LED
LE012			
LE031	3939356000	LT9233 (Green)	LED
LE032	3939173005	LT9213R (Red)	LED
~039			
LE040, 041	3939356000	LT9233 (Green)	LED
l	TORS (not inclu	ded Carbon Film ±5%, 1/4V	V Type)
B304	2410193000	2.2k ohm ±5% 1/2W	Carbon Film
R304			
	2440033020	220 ohm ±5% 1W	Metal Oxide
H3 15	STANSON OF		(NBF)
R315			
R3 15	CA	APACITORS	
		9, 14	(AC) Ceramic
C001	2538014003	0.01μF ±20% 400V	
C001 C101	2538014003 2531024003	0.01μF ±20% 400V 0.01μF +80,-20% 50V	Ceramic
C001 C101 C102~104	2538014003 2531024003 2531026001	0.01μF ±20% 400V 0.01μF +80,-20% 50V 0.047μF +80,-20% 50V	Ceramic Ceramic
C001 C101	2538014003 2531024003	0.01μF ±20% 400V 0.01μF +80,-20% 50V	Ceramic

Ref. No.	Part No.	Part Name & Descriptions
C108	2544237007	10μF 16V Electrolytic
C111	2544237036	47μF 16V Electrolytic
C112	2544243017	1μF 50V Electrolytic
C113 C114	2544241006 2544237007	4.7μF 35V Electrolytic 10μF 16V Electrolytic
C114 C115	2544243033	10μF 16V Electrolytic 3.3μF 50V Electrolytic
C117	2531026001	0.047µF +80,—20% 50V Ceramic
C118	2533627000	100pF ±5% 50V Ceramic
C119	2531024003	0.01μF +80,-20% 50V Ceramic
C120	2531026001	0.047μF +80,-20% 50V Ceramic
C201	2544237001	10μF 16V Electrolytic
C202 C203	2544237049 2544243017	100µF 16V Electrolytic 1µF 50V Electrolytic
C203	2544243017	1μF 50V Electrolytic 0.47μF 50V Electrolytic
C205,206	2544243017	1μF 50V Electrolytic
C207	2531026001	0.047µF +80,-20% 50V Ceramic
C208	2533639001	330pF ±5% 50V Ceramic
C209	2544237007	10µF 16V Electrolytic
C210,211	2534350004	680pF ±5% 50V Ceramic
C212 C213	2544243033 2531024003	3.3μF 50V Electrolytic 0.01μF +80,-20% 50V Ceramic
C214,215	2544243033	3.3 µF 50V Electrolytic
C216,217	2539031069	2700pF ±10% 25V Ceramic
C218,219	2539030002	1000pF ±10% 25V Ceramic
C220,221	2539031056	1800pF ±10% 25V Ceramic
C301	2544243004	0.47μF 50V Electrolytic
C302,303	2533635005	220pF ±5% 50V Ceramic
C311 C312	2544239092 2544237007	1000μF 25V Electrolytic 10μF 16V Electrolytic
C312	2544237049	100μF 16V Electrolytic
C314~316	2544237007	10µF 16V Electrolytic
C317	2531024003	0.01µF +80,-20% 50V Ceramic
C321,322	2531024003	0.01µF +80,-20% 50V Ceramic
C351	2590004006	22000µF Backup Capacitor
C401 C402	2531024003 2544235025	0.01μ F +80,-20% 50V Ceramic 47 μ F 10V Electrolytic
C402 C403~406	2531024003	47μF 10V Electrolytic 0.01μF +80,-20% 50V Ceramic
C407	2544235038	100µF 10V Electrolytic
C408	2531024003	0.01µF +80,-20% 50V Ceramic
C409,410	2533618006	43pF ±5% 50V Ceramic
C411,412	2531024003	0.01µF +80,-20% 50V Ceramic
C413,414 C415	2544243020 2544243004	2.2µF 50V Electrolytic 0.47µF 50V Electrolytic
C416	2531024003	0.01µF +80,-20% 50V Ceramic
C417,418	2544241006	4.7µF 35V Electrolytic
C419	2531024003	0.01µF +80,-20% 50V Ceramic
C421	2531024003	0.01µF +80,-20% 50V Ceramic
C431	2544237049	100μF 16V Electrolytic
C432	2543016009	1μF 50V Electrolytic (By Pole)
C433	2531025002	0.022µF +80,-20% 50V Ceramic
C434	2549011008	1μF 50V Electrolytic
		(Low Leak)
C435	2531024003	0.01µF +80,-20% 50V Ceramic
C441 C442	2531026001 2533125007	0.047µF +80,—20% 50V Ceramic 15pF ±5% 50V Ceramic
C442	2533125007	(Temp.)
C443	2554201049	390pF ±5% 50V Plastic Film
C444	2544243020	2.2µF 50V Electrolytic
C451	2531026001	0.047μF +80,—20% 50V Ceramic
C452	2533143005	82pF $\pm 5\%$ 50V Ceramic (Temp.)
C453	2554127000	180pF ±5% 50V Plastic Film
C454	2544243020	2.2µF 50V Electrolytic
C501	2531024003	0.01μF +80,-20% 50V Ceramic
C502~504	2539030028	2200pF ±10% 25V Ceramic
C601	2544243033	3.3μF ±20% 50V Electrolytic
C602 C603	2544243033 2544237052	0.47µF ±20% 50V Electrolytic 220µF ±20% 16V Electrolytic
TC001	2130022008	Trimmer Condenser 1
TC002	2130022000	Trimmer Condenser 1
1		1 1

	Ref. No.	Part No.	Part Name & Desc	riptions	
		C	OIL, TRANS		
	L201,202 T001 T003 T004 T011 T012 T021 T022 BT1 CF001, 002 CF003 CF004 XL001	2350032014 2312060008 2313028007 2320106006 2311122002 2311123001 2311124000 2311125009 2310074009 2610064007 2610031001 2610079005 3990031005	Inductor 39mH FM IF Det. Trans AM IFT Anti Birdie Filter MW Ant. Trans MW OSC Coil LW Ant. Trans LW OSC Coil Balun Trans FM Ceramic Filter (SFT10.7MS2) AM Ceramic Filter (BFU Ceramic Filter (CSB456F11) X-tal (7.2MHz)	450C4)	2 1 1 1 1 1 1 1 2 1 1
	SW001 SW002 SW003 SW011 ~025	2129543006 2124630008 2124629006 2124407008	1P Push Switch (Mode) 1P Push Switch (MPX) 1P Push Switch (Power) Tact Switch	•	1 1 15
			E.U.P		
▲	PT001 FL001	2335565001 3934030004 2050350009 2160039003 2048224008	Power Trans 7BT16ZA (FLD) Antenna Terminal Front End 2P Pin Jack	•	1 1 1 1 1 1
		ОТ	HER PARTS		
	CN301 CN701 CN702, 703	2221371105 2090008146 2090008120 EP-5667H1 1460858008 1460857009 2034362000 2042197018 2042197005 2050190036 2050190078	(P.W. Board) Jumper Wire P=5mm Jumper Wire P=10mm Terminal Pin LED Holder 3P Connector Cord 7P Connector Cord 7P Connector Base 7P NH Connector Base	•	1 3 66 8 1 1 1 2 1 3

ETC0852 TUNER UNIT PARTS LIST for U.K (J220 or J240) means only difference of jumper for selecting power voltage between 220V and 240V.

[•] indicates the parts newly used in this unit.

ETC0861D TUNER UNIT PARTS LIST (for 2 Band)

Ref. No.	Part No.	Part Name & Desc	riptions
	SEMI	CONDUCTORS	
T	2630438008	LA1266 (Sanyo)	IC •
C001		LA3401 (Sanyo)	ic •
C002	2630439007	TD6104P (Toshiba)	ic
C003	2630232000		ic
C004	2620452104	TC9147BP (Toshiba)	ic
C005	2620453006	TD6301AP (Toshiba)	ic
C006	2620300007	HD14011BP (Hitachi)	Transistor
R001	2730025023	2SC461(C)	
R002 -004	27303,22001	2SC2458(Y/GR)	Transistor
R006, 007	2730322001	2SC2458(Y/GR)	Transistor
rR008	2750053004	2SK365(BL/GR)	FET
rR009,	2730322001	2SC2458(Y/GR)	Transistor
010	2710194000	2SA1048(Y/GR)	Transistor
TR011 TR012	2730322001	2SC2458(Y/GR)	Transistor
~014		200101E/PL)	Transistor
TR015	2730198015	2SC1815(BL)	Transistor
TR016	2730322001	2SC2458(Y/GR)	FET
TR017	2750053004	2SK365(BL/GR)	
TR018	2740065002	2SD880(Y)	Transistor
TR019	2730322001	2SC2458(Y/GR)	Transistor
TR020	2730198015	2SC1815(BL)	Transistor
TR021,	2710194000	2SA1048(Y/GR)	Transistor
022			1
TR023	2750053004	2SK365(BL/GR)	FET
TR024,	2730322001	2SC2458(Y/GR)	Transistor
025		0001010101010101010101010101010101010101	Transistor
TR026	2710194000	2SA1048(Y/GR)	Transistor
TR027	2730322001	2SC2458(Y/GR)	Transistor
TR028	2710194000	2SA1048(Y/GR)	Transistor
~030		0000450/V/CB)	Transistor
TR051	2730322001	2SC2458(Y/GR)	Transistor
TR052	2710194000	2SA1048(Y/GR)	Diode
D001	2760049008	152076	Zener
D002	2760185014	HZ4B-3	
D003~006	2760049008	1S2076	Diode
D007	2760051054	HZ7A-1	Zener
D008	2760255038	HZ12C-2	Zener
D009	2760446009	PB103M	Dist.
D010	2760049008	1S2076	Diode
D011,012	2760302004	SVC321SP-D2	Varactor
D051	2760049008	1S2076	Diode
LE011	3939173005	LT9213R (Red)	LED
LE012	3939356000	LT9233 (Green)	LED
LE031	3939356000	LT9233 (Green)	LED
LE032	3939173005	LT9213R (Red)	LED
~039			
LE040, 041	3939356000	LT9233 (Green)	LED
	STORS (not incl	l uded Carbon Film ±5%, 1,	/4W Type)
R304	2410193000	2.2k.ohm +5% 1/	2W Carbon Film
R315	2440033020	220 ohm +5% 1V	V Metal Oxide
			(NBF)
		CAPACITORS	
C001	2538014003	0.01µF +:±20% 40	NO ATWARCE CE LOUINE
C101	2531024003	0.01 _u F +80,-20% 50)V Ceramic
C102~104	1	0.047µF +80,—20% 50)V Ceramic
C102 104	2531024003	0.01 µF +80,-20% 50	V Ceramic
C105	2544237036	47µF 16	SV Electrolytic
	2544237007	1	SV Electrolytic
C108	2544237007	1 10/4.	SV Electrolytic
C111		1	OV Electrolytic
C112	2544243017	,	V Electrolytic
C113	2544241006	1	SV Electrolytic
C114	2544237007	1.00.	OV Electrolytic
C115	2544243033 2531026001	3.3µF 50 0.047µF +80,—20% 50	
C117		・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・	, v ociannio

R	ef. No.	Part No.	Part Name & Description	5
C1	18	2533627000	100pF ±5% 50V Cerai	1
C1	1	2531024003	0.01µF +80,-20% 50V Cerai	
C1	20	2531026001	0.047 _µ F +80,-20% 50V Cerai	1
C2	01	2544237001	10μ1	rolytic
C2	02	2544237049	100µ.	trolytic
C2	03	2544243017	ιμι	trolytic
C2	04	2544243004	0.17 p.	trolytic
C2	05,206	2544243017		trolytic
C2	07	2531026001	0.047μF +80,-20% 50V Cera	
C2	08	2533639001	330pF ±5% 50V Cera	
C2	09	2544237007	10μ1	trolytic mic
C2	10,211	2534350004	500p.	trolytic
C2	12	2544243033		
C2	13	2531024003	0.01ml 100, 2011	trolytic
C2	14,215	2544243033	υ.υμι	
C2	16,217	2539031069	270001	
C2	18,219	2539035036		
C2	20,221	2539031056	1000p1	. 1
	101	2544243004		trolytic mic
C3	302,303	2533635005	220pF ±5% 50V Cera	
C3	311	2544239092	1000%	trolytic
C3	312	2544237007	1041	trolytic
	313	2544237049	100μ.	trolytic
	314	2544237007	10μF 16V Elec	trolytic
~:	316			io
	317	2531024003	0.01 µF +80, -20% 50V Cera	
C	321,322	2531024003	0.0 μ, 100, 2011	
C	351	2590004006	220004	mic
C4	401	2531024003	0.01µ1 100, 2011	trolytic
C4	402	2544235025		
C4	403~406	2531024003	0.01μ.	amic
C4	407	2544235038	1004.	trolytic
C	408	2531024003	0.01μ1 .007	amic
lc.	409,410	2533618006	40pi	amic
I C	411,412	2531024003	0.01µ1 100, 2010	amic
lc4	413,414	2544243020	1 2.2 %	trolytic
	415	2544243004		ctrolytic
lc.	416	2531024003	0.0121	amic
	417,418	2544241006		ctrolytic
lc	419	2531024003		amic
•	421	2531024003	0.0 μ00, Εσ.	amic
	431	2544237049	1004.	ctrolytic
	432	2543016009	1 1/21	ctrolytic
ľ	. 1			Pole)
lc	433	2531025002	0.022mi 1007 2010	amic
lc	434	2549011008		ctrolytic
1				w Leak) amic
C	435	2531024003	1 0.0111 100, 2070	
C	:441	2531026001	0.0-17 M. 1007 TT	amic amic
10	442	2533125007		mp.)
1			1	stic Film
	:443	2554201049	390pF ±5% 50V Pla	amic
	501	2531024003	0.0141	amic
C	502~504	2539030028	2200pi	
	601	2544243033	0.00.	ctrolytic ctrolytic
	602	2544243004	1	ctrolytic
C	603	2544237052	220μ1 =20.0	1 1
Į٦	C001	2130022008	Trimmer Condenser	'
1		1		
		<u></u>		
			COIL, TRANS	
Ī	201,202	2350032014	Inductor 39mH	2
- 1	Γ001	2312060008	FM IF Det. Trans	1
	г003	2313028007	AM IFT •	1
	гооз	2320106006	Anti Birdie Filter	1
		2311122002	MW Ant. Trans	1
	Γ011 Γ012	2311122002	MW OSC Coil	1
	Γ012	2311123001	Balun Trans	1
1 F	3T1	1 20 100 / 4009	1 20.0	1

Ref. No.	Part No.	Part Name & Descr	iptions	
CF001,	2610064007	FM Ceramic Filter		2
002		(SFT10.7MS2) AM Ceramic Filter (BFU4	150C4)	1
CF003 CF004	2610031001 2610079005	Ceramic Filter	• 0 17	i
CF004	2010073000	(CSB456F11)	,	1
XL001	3990031005	X-tal (7.2MHz)		
	S	WITCHES		
SW001	2129543006	1P Push Switch (Mode)		1 1
SW002	2124630008 2124629006	1P Push Switch (MPX) 1P Push Switch (Power)	•	'
SW003 SW011,	2124407008	Tact Switch		2
012 SW014	2124407008	Tact Switch		12
~025	2124107000			
		E.U P	I - 2€5870×15 22	
PT001	2335565001	Power Trans	•	1
FL001	3934030004	7BT16ZA (FLD) Antenna Terminal		1 1
	2050350009 2160039003	Front End		1
	2048224008	2P Pin Jack		1
	01	THER PARTS		1
	2221396009	(P.W. Board)	•	1 3
	2090008146	Jumper Wire P=5mm Jumper Wire P=10mm		66
	2090008120 EP-5667H1	Terminal Pin		8
	1460858008	LED Holder	1:	1
	1460857009	FLD Holder		1 1
CN301	2034362000 2042197005	3P Connector Cord 7P Connector Cord	•	2
CN702, 703	2042157005			١.
	2050190036	3P NH Connector Base 7P NH Connector Base		1 3
CN701	2050190078	7P Connector Cord	•	1
1				
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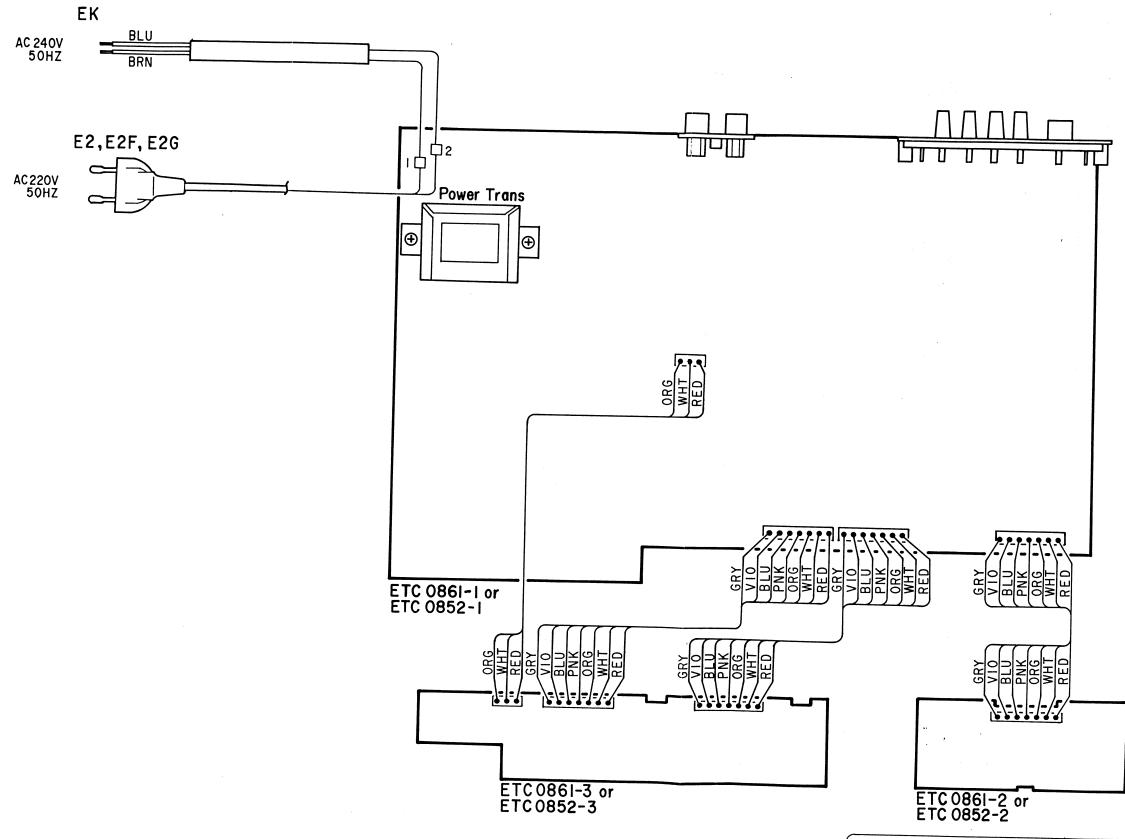
– 13 –

ETC0861 TUNER UNIT PARTS LIST for GERMANY (Same as ETC0861D TUNER UNIT P/LIST except the followings.)

the follow	mys./	
Ref. No.	Part No.	Part Name & Descriptions
	RE	SISTOR
R108	2412120000	15k ohm ±5% 1/4W Carbon Film (Change)
	CAP	ACITORS
C302,303	2533635005	220pF ±5% 50V Carbon (Delete)
	(COILS
L601	2350016014	18μΗ Inductor (Add.)

[•] indicates the parts newly used in this unit.

WIRING DIAGRAM



	Model Name	Unit No.
2 Band	Black for European	ETC0861D
2 Band	Black for Germany	ETC0861
2 Band	Gold for Germany	ETC0861
3 Band	Black for European	ETC0852B
3 Band	Black for U.K.	ETC0852
3 Band	Black for France	ETC0852

CAUTION

- With the power switch in "Stand by" mode, mains is still connected.

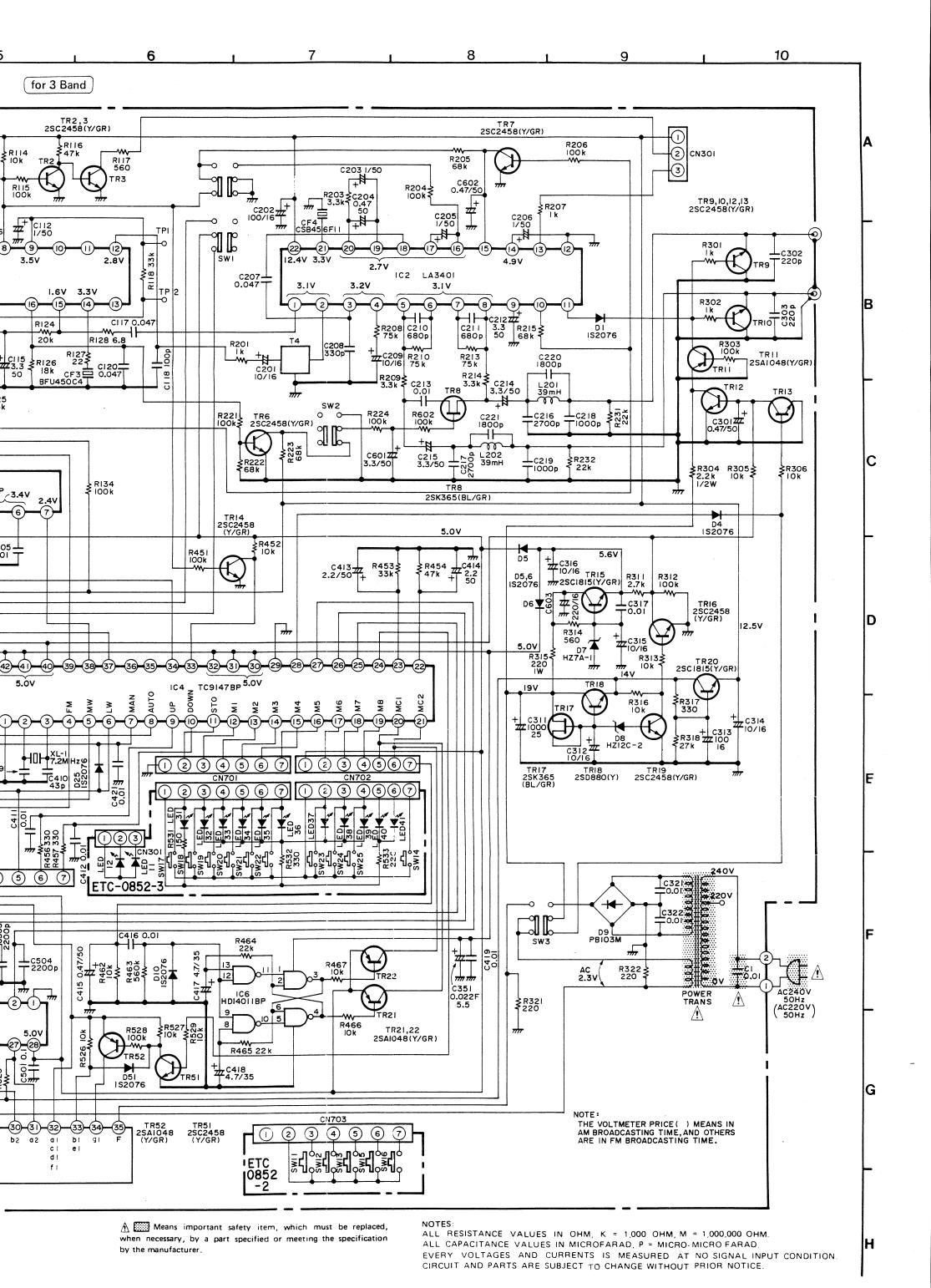
WICHTIGER HINWEIS — Auch bei auf "Betriebsbereitschaft" gestelltem Netzschalter wird das Gerät noch mit Strom versorgt.

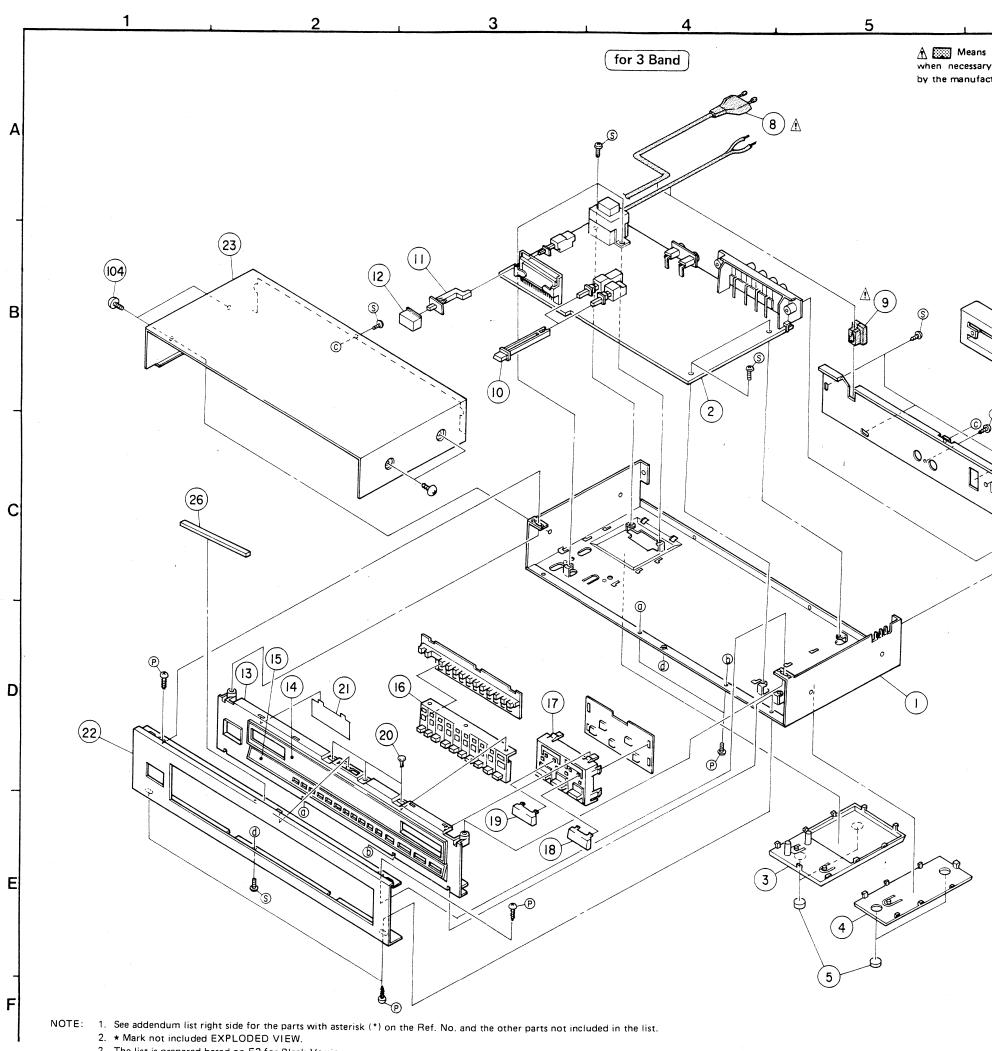
PRECAUTION OBS!

- L'interrupteur d'alimentation sur "stand by" (attente), l'alimentation n'est pascoupée.

– Nätströmtillförseln kopplas inte ur när strömbrytaren står i beredskapsläget (Sa 🎜 by).

5 for 3 Band ETC-0852-1 TR2,3 2SC2458(Y/GR) R116 ¥47k ±0.01 10.01 ₹ 600 10k RI 17 560 RI05 777 7.6V(9.3V) R103 ≱ 8.2k ₹ R115 100k 11.8V FRONT - END CF2 SFTIOMS2 2SC461 - FM75Ω C103 C104 100 RIO4 RIO6 2.3V CF I = GND 3.5V 2.87 7.6V(9.3V) FM 300Ω osc ICI LAI266 RIO7 .8V 3.2V 3.5V 3.4V (9.3V) BT-I 1.6V 3.3V GND R433 R123 5.1k 7/7 CIO6 47/16 R124 **★** D3 10/16 C105 R128 6.8 -**///** 20k AM CII3 4.7 Z 35 C1 14 10/16+ + C115 -7 27 \$ 27/3.3 50 IS2076 RIO8 8.0V N D2 """ HZ4B-3 C435 0.01 18k CF3 0.047 BFU450C4 4.7k ≹R126 18k R415 33k R411 100k C451 0.047 TR4 2SC2458(Y/GR) R421 100k ₹ RI34 ₹ I00 k IC3 TD6104P_3.4V R412 100k 5.00 3.9V (12V) D22 lok R601 470 C40277 C403 47/10 0.01 D24 C405 1 R422 100k D23,24 IS2076 TR41-44 2SC2458(Y/GR) DII,12,21,22 SVC321SP-D2 R402 100 12.5V R425 ≱ R417 ≸ R431 ≱ C431 # C407 # C408-C432 1/50 BP ₹R404 220 0.01 5.ÒV R403 8.2k R408 100 **TR25** TR27 TR47 TR23 2SK365 (BL/GR) R455 330 C409 43p R418 10k TR24 2SC2458 (Y/GR) R426 **∤**R432 ₹R407 lOk (4.9V LW) lOk (4.9V MW) 4.90 TR25, 27, 47 2SC2458(Y/GR) CN703 21 \odot (2) (3) 4 (5) 6 ETC-0852-≹R502 100 k ₹R503 C416 0.01 TR29,30,48 TR29 2SAI048 (Y/GR) C41 TR30 IC5 TD630IAP D26 R528 100k Š, 27<u>-</u>28 TR52 D51 1S2076 FM b5 94 MHz c5 D.P 35_F -(14) b4 TR5 2SAIC (Y/G (13) -(6) 93 -22-23-b3 a3 (12) LW MW KHz f4 **e**4 d4 c4 bı eı G α4 f3 d3 c3 b2 a2 ۵ı gi d I fΙ FLD 7-BT-16ZA





- 3. The list is prepared based on E2 for Black Version.
- 4. indicates the parts newly used in this unit.

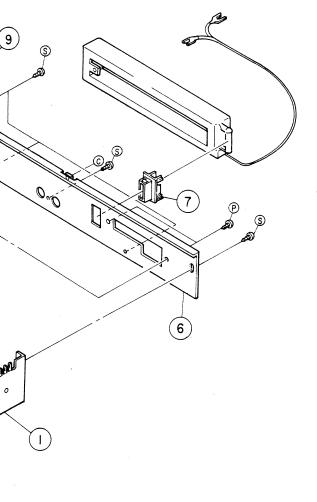
EXPLODED VIEW OF CHASSIS AND CABINET

No.	Part No.	Part Name & Descriptions		Q'ty
1 *2 3 4 5 *6 7 A *8	4110595016 ETC0852B 1030948005 1030949004 4610162004 1050715001 1460859007 2062047009	CHASSIS TUNER UNIT BOTTOM COVER (A) BOTTOM COVER (B) FELT PAD BACK PANEL ANT. HOLDER AC CORD	•	1 1s 1 1 4 1 1
A *9 **10 11 **12 **13 **14 *15 **16 **17 **18 **19 20 21 **22 23 24 *25 26 27	4450056008 1130866003 1190057001 1130854002 1460851005 1430491000 1430492009 1130860009 1130861008 1130862007 1130862010 4770096007 1430493008 1441541004 1020262005 5138253009 4450033005	CORD BUSH PUSH KNOB (C) KNOB JOINT PUSH KNOB (P) (POWER) INNER PANEL WINDOW PLATE ESC PLATE PUSH KNOB (A) PUSH KNOB (B) (TUNING) KNOB CAP (D) (TUNING) KNOB CAP (D) (TUNING) PUSH RIVET FILTER FRONT PANEL TOP COVER APPROVAL MARK WIRE CLAMP BAND	•	1 2 1 1 1 1 1 1 1 1 3 1 1 1 1 1 1 1 1 1

Ref. No.	Part No.	Part No. Part Name & Descriptions				
SCREWS						
101 102 103	4737002021 4737508017	TAPPING SCREW (S) 3x8 BLA TAPPING SCREW (P) 3x10	СК	12 8		
104 105 106	4734454038	TRUSS TAPPING SCREW (2) 4	8×	4		
PACI	KING & ACCESS	ORIES (not included EXPLODED	VIE	W)		
201 202 *203 204	5050133003 5030576004 5011141005	CABINET COVER CUSHION CARTON CASE	•	1 2 1		
205 206 207 208 *209 210 211 212	PC-3244 2311126008 2032101001 5111476007 5139111014 5131167008	ENVELOPE LOOP ANTENNA 2P CONNECTOR CORD INST. MANUAL COLOR LABEL (BLACK) CONTROL CARD	•	1 1 1 1 2 1		

6

Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



ADDENDUM LIST

		Part No.					
Ref. No.	Part Name & Descriptions	EK for U.K.	E2F for France				
2 6 & 8 & 9 15	TUNER UNIT BACK PANEL AC CORD CORD BUSH ESC. PLATE	ETC0852 1050693000 2062051008 4450056008 1430492009	ETC0852 1050702001 2062047009 4450056008 1430492009				
104	TAPPING SCREW (4x8)	4734454038	4734454038				
203 209	CARTON CASE COLOR LABEL	5011141005 5139111014	5011141018 5139111014				
				-			
	- · · · · · · · · · · · · · · · · · · ·						
,				,			
	,						
		:					
					·		

For United Kingdom model only.

WARNING:

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

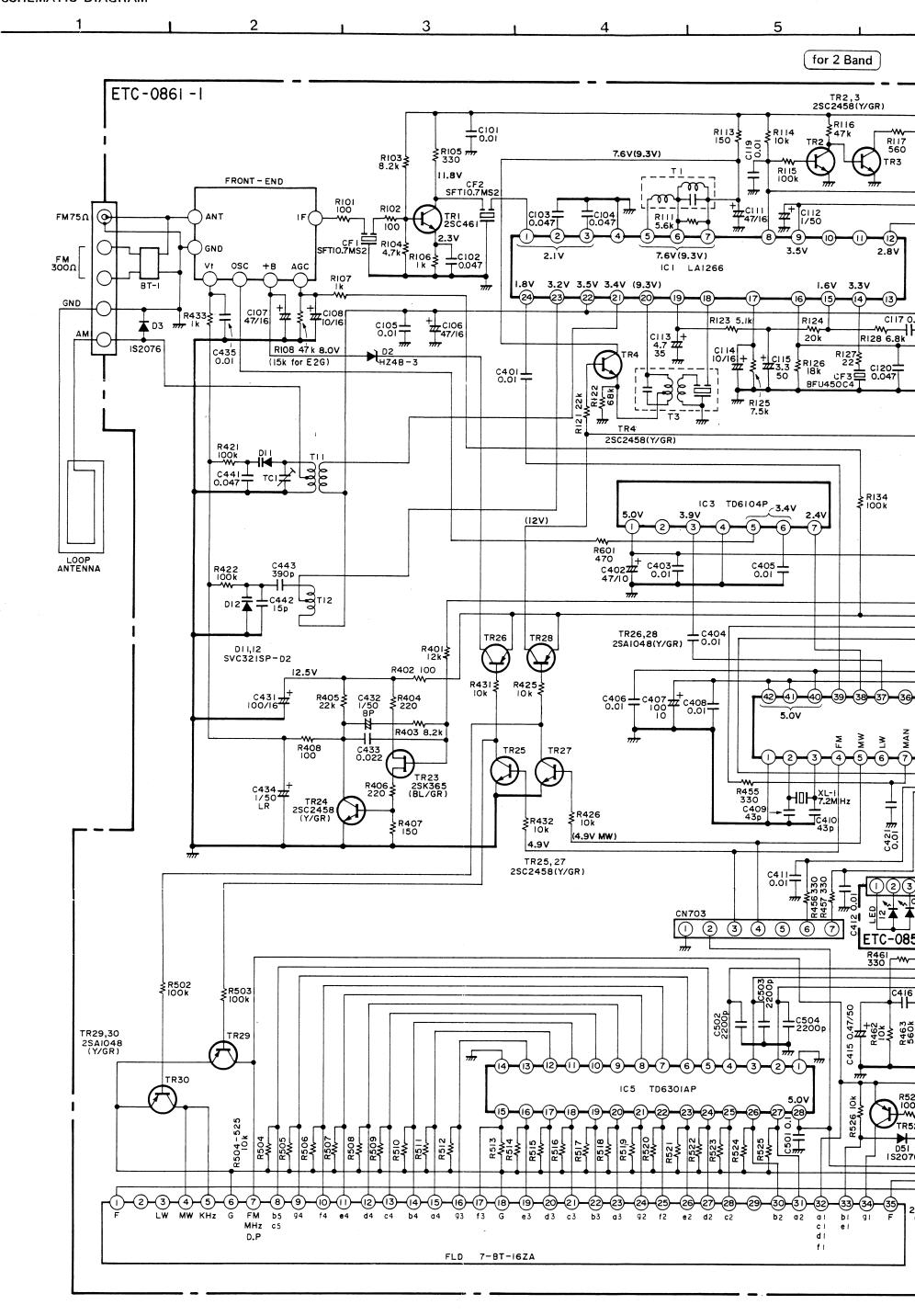
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black. The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

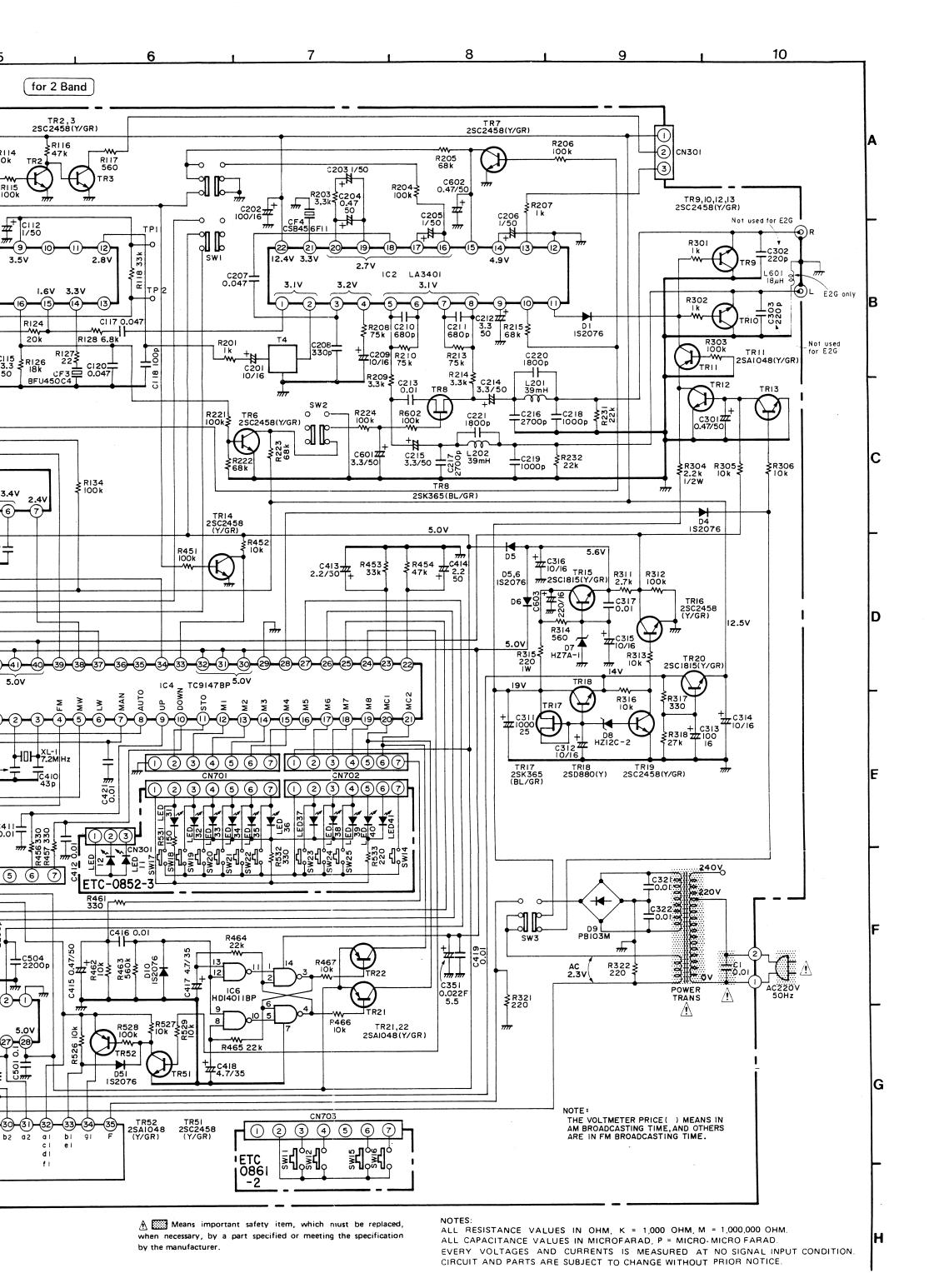
The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

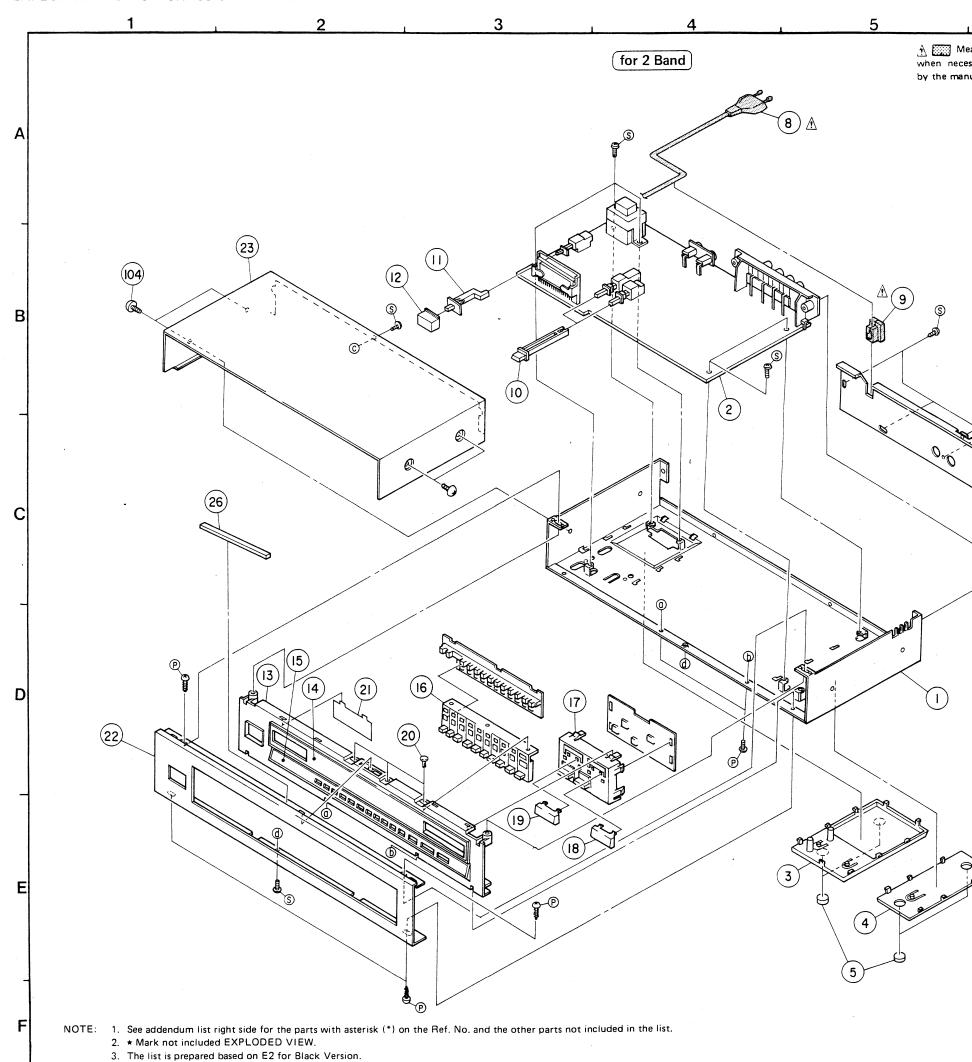
Blue: Neutral Brown: Live





TU450/450L

EXPLODED VIEW OF CHASSIS AND CABINET



4. • indicates the parts newly used in this unit.

EXPLODED VIEW OF CHASSIS AND CABINET PARTS LIST

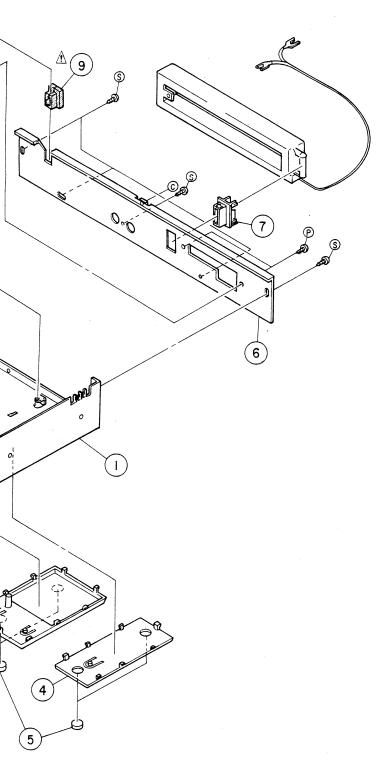
Ref. No.	Part No.	Part Name & Descriptions		Q'ty	Ref. No.	Part No.	Part Name & Descriptions	Q'ty
1	4110595016	CHASSIS		1	SCREWS			
*2	ETC0861D	TUNER UNIT BOTTOM COVER (A)		1s	101	470700004	TARRING CORFIN (C) 2. C. DI ACK	12
3 4	1030948005	BOTTOM COVER (A)			101	4737002021	TAPPING SCREW (S) 3x8 BLACK TAPPING SCREW (P) 3x10 BLACK	1 - 1
5	4610162004	FELT PAD		4	102 103	4737508017	TAPPING SCREW (P) 3X TO BLACE	` "
*6	1050693000	BACK PANEL		1 1	*103	4734454038	TRUSS TAPPING SCREW (2) 4×8	4
1 7	1460859007	ANT. HOLDER			104	4734454036	THUSS TAPPING SCREW (2) 4x6	7
A *8	2062047009	AC CORD	1		105			
A *9	4450056008	CORD BUSH			100			
**10	1130866003	PUSH KNOB (C)		2	BACK	ING & ACCESSO	ORIES (not included EXPLODED VI	W)
111	1190057001	KNOB JOINT		1	FACK	ING & ACCESS	SKIES (NOT INCIDUED EXTERDED VI	
**12	1130854002	PUSH KNOB (P) (POWER)		1 1	201	5050133003	CABINET COVER	1
**13	1460851005	INNER PANEL	•	1 1	202	5030576004	CUSHION	2
**14	1430491000	WINDOW PLATE		1 1	*203	5011141034	CARTON CASE	1
*15	1430492012	ESC PLATE		1 1	204	_	_	
**16	1130860009	PUSH KNOB (A)		1 1	205	PC-3244	ENVELOPE	1 1
**17	1130861008	PUSH KNOB (B) (TUNING)		1	206	2311126008	LOOP ANTENNA	1
**18	1130862007	KNOB CAP (D) (TUNING)		1	207	2032101001	2P CONNECTOR CORD	1
**19	1130862010	KNOB CAP (D) (TUNING)		1 1	208	5111476007	INST. MANUAL	1
20	4770096007	PUSH RIVET		3	*209	5139111014	COLOR LABEL (BLACK)	2
21	1430493008	FILTER		1	210	5131167008	CONTROL CARD	1
**22	1441541017	FRONT PANEL	•	1	211			
23	1020262005	TOP COVER	١	1 1	212			
24	5138253009	APPROVAL MARK		1				
★25	4450033005	WIRE CLAMP BAND		1				
26	4610319006	SPACER		1				
27								
28								

E2 Gold Version PARTS LIST (Same as E2 BLACK VERSION except the followings.)

12 1130854015 PUSH KNO 22 1441541020 FRONT PA 23 1020262018 TOP COVE 104 4734801005 TRUSS TAI 203 5011141063 CARTON C	except the followings.)							
22 1441541020 FRONT PA 23 1020262018 TOP COVE 104 4734801005 TRUSS TAI 203 5011141063 CARTON C		Part No.	Part Na					
	22 23 104 203	1441541020 1020262018 4734801005 5011141063	PUSH KNO FRONT PA TOP COVE TRUSS TAF CARTON C COLOR LA					

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by the manufacturer.



Id Version PARTS LIST as E2 BLACK VERSION (Left P/List) the followings.)

Part No.	Part Name & Descriptions	Q'ty
1130854015 1441541020 1020262018 4734801005 5011141063 5139111001	PUSH KNOB (P) FRONT PANEL TOP COVER TRUSS TAPPING SCREW 4x8 CARTON CASE COLOR LABEL (GOLD)	1 1 4 1 2

ADDENDUM LIST

5 ()	0.11	Part No.					
Ref. No.	Part Name & Descriptions	E2G for Germany					
2 6 A 8 A 9 15	TUNER UNIT BACK PANEL AC CORD CORD BUSH ESC. PLATE	ETC0861 1050703000 2062047009 4450056008 1430492012					
104	TAPPING SCREW (4×8)	4734454038					
203 209	CARTON CASE COLOR LABEL	5011141021 5139111014					
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